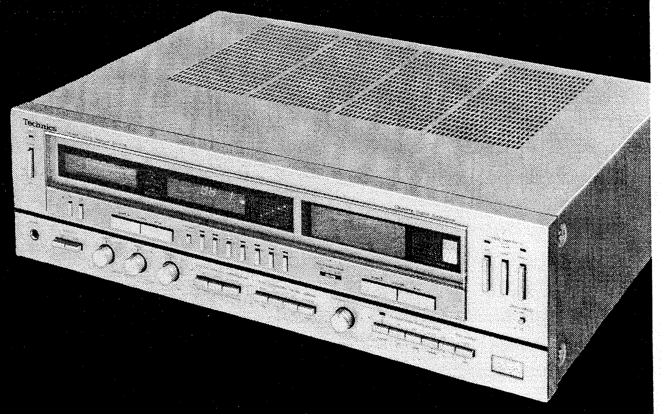
Technics

FM/AM Stereo Receiver

SA-828

OPERATING INSTRUCTIONS



Before operating this unit, please read these instructions completely.

Dear Stereo Fan

Technics. The science of sound. Our name represents over 100 high quality audio products, in every price range.

From our revolutionary direct-drive turntables to our highly acclaimed linear-phase speakers, Technics quality and value have become almost legendary among audio enthusiasts.

Our truly complete selection of turntables (including belt-drive, direct-drive, and quartz-locked models with varying degrees of automation) now includes an exciting line of linear tracking turntables with zero tracking error. Another innovation, direct-drive cassette decks, is available in both slim and micro formats. In fact, with Technics micro series, you can assemble an entire system of the highest quality with truly compact dimensions. And our receivers, which combine new class-A amplification with quartz-synthesizer tuning, have created tremendous excitement among reviewers and customers alike.

Amplifiers, tuners, headphones, microphones, cartridges, open reel decks, sound processors—we are proud of all our high quality equipment, and we are constantly seeking to improve our products in terms of performance and handling ease. In addition, our confidence in the reliability of our merchandise (demonstrated by our warranties) and the reasons for our enormous and rapid growth become obvious.

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PRODUCT SERVICE

■ Warning concerning removal of covers

This unit should be serviced by qualified technicians only.
No service information is provided for customers.
Should your "Technics" product ever require servicing, refer to the Directory of Authorized Service Centers or your franchised "Technics" dealer for detailed instructions.

■ Location of serial number

You will find the serial number located on the back of the unit.

MAINTENANCE OF EXTERNAL SURFACES

To clean, use a soft dry cloth.
If the surfaces are extremely dirty, use a soft cloth, dipped into a soap and water solution or a weak detergent solution.
Wring the cloth well before wiping the unit.
Wipe once again with a soft dry cloth.
Never use alcohol, paint thinner, or benzine, nor a chemically treated cloth to clean this unit.
Such chemicals may damage the finish of your unit.

ACCESSORY

- FM indoor antenna 1

The model number of this product may be found on the back of the unit; and the serial number on the label affixed to the back of the unit.
You should note the model and serial numbers of this unit in the space provided, and retain this booklet as a permanent record of your purchase to aid in identification in the event of theft.

MODEL NUMBER ______________ SERIAL NUMBER ______________

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

BATTERIES (option): THEIR USE AND INSERTION/ REMOVAL

Batteries [size AA (UM-3) 1.5V] are required in order to assure continued operation of the memory systems.
When AC power to the unit is turned off or is interrupted, the pre-set tuning*1 and "most-recent" memory*2 will be erased and must be reset again. Be sure to install the required batteries before operating this unit.

***1. Preset tuning**
The preset tuning is a system by which any desired broadcast station which has been preset by using one of the preset tuning buttons ⑤ can be tuned by simply touching one button.

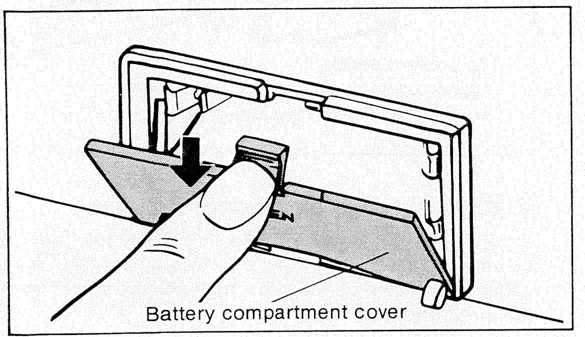
***2. Most-recent memory**
The most-recent memory is a system by which the unit "remembers" the FM or AM broadcast station last heard when any of the functions of this unit are turned off, and automatically tunes to that station the next time the power is turned on.

■ Type of batteries

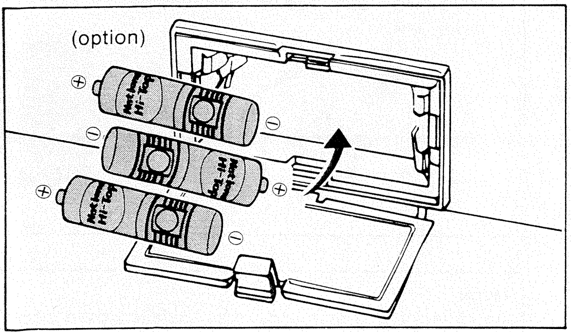
Use three AA-size (UM-3: 1.5V) batteries for this unit.

■ Insertion of batteries

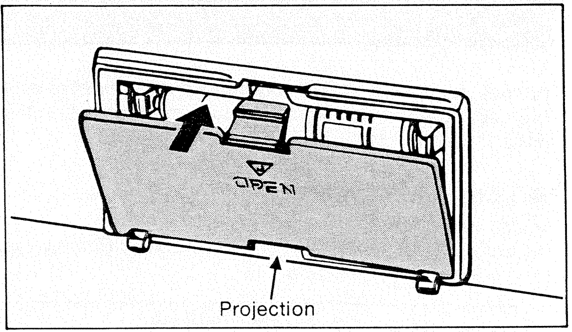
1. Move the battery compartment cover in the direction of the arrow.



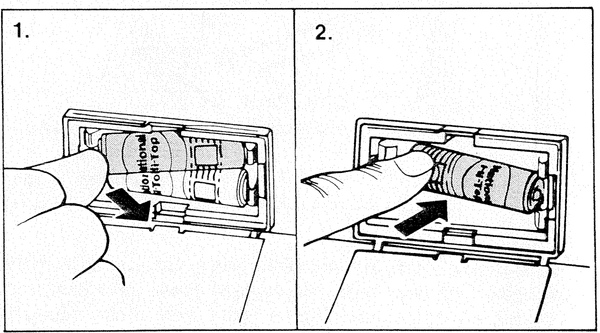
2. Insert the batteries into the battery compartment.



3. Fit the projection of the battery compartment cover into this original position, and close the cover.



■ Removal of batteries



■ Battery life

About 1 year.

■ Notes concerning the batteries

1. Be sure the batteries are inserted so that the positive (+) and negative (−) polarities are correct.
2. Never subject the batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
3. If the unit is not to be used for a long time, remove the batteries and store them in a cool dark place.
4. Always remove old, weak or worn-out batteries promptly and dispose of them.
5. Never mix old and new batteries, nor batteries of different types.

IF THE BATTERIES BECOME WEAK

If the batteries are consumed, the "preset tuning" and the "most-recent" memory are erased, making it necessary to re-program the memory.
If the batteries are consumed, the display will show 87.9 MHz and 530 kHz (allocation switch setting: FM 0.2 MHz/AM 10 kHz) or 87.5 MHz and 522 kHz (allocation switch setting: FM 0.05 MHz/AM 9 kHz) no matter which of the preset-tuning buttons ⑤ is pressed.

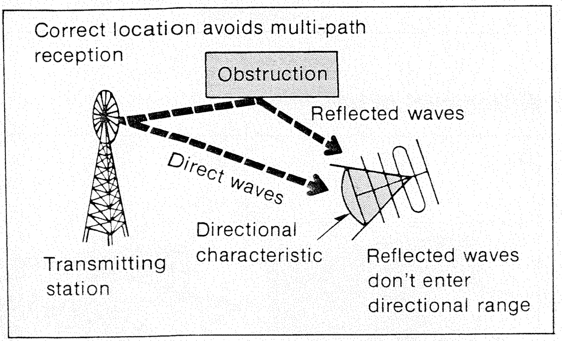
FM ANTENNA

For best reception of FM broadcasts, select an FM antenna with the best characteristics for the area in which the unit is to be used.

Location of antenna

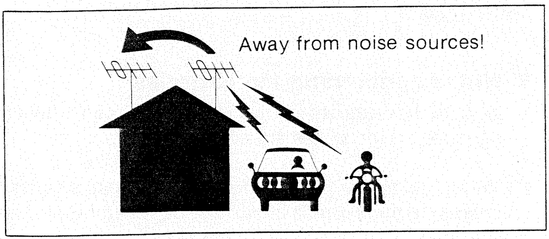
Install the antenna:

1. Where it will receive FM broadcast signals directly; not in the "shadow" of a building.

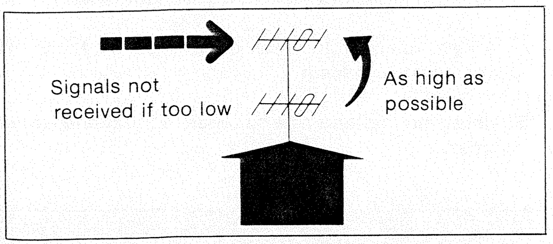

Correct location avoids multi-path reception
Obstruction
Reflected waves
Direct waves
Directional characteristic
Transmitting station
Reflected waves don't enter directional range

Note:
Multi-path distortion is the distortion which results from the reception of two types of signals: those reflected from nearby buildings, mountains, etc., and those received directly from the broadcasting station.

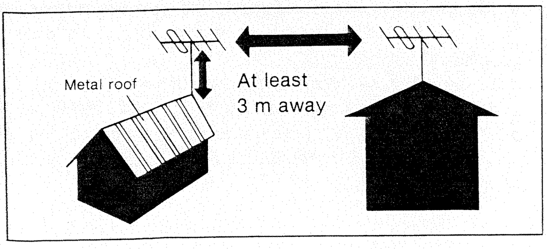
2. Away from busy roads, and away from neon signs.


Away from noise sources!

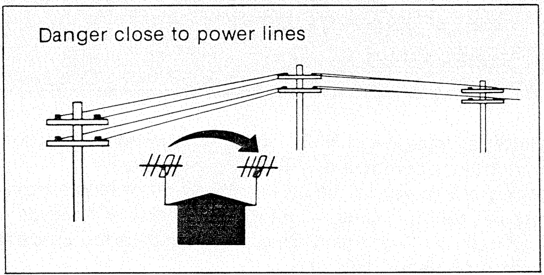
3. At least 4 meters (12 feet) above the ground (except in mountainous regions, etc.).


Signals not received if too low
As high as possible

4. At least 3 meters (10 feet) away from a metal roof or other antennas.


Metal roof
At least 3 m away

5. To avoid danger, away from electric power lines.


Danger close to power lines

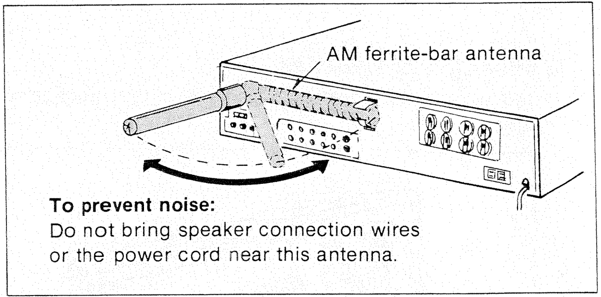
Note:
An outdoor antenna should be installed by a competent technician only.

AM ANTENNA

This unit includes a highly sensitive built-in ferrite-bar antenna for AM broadcast reception. No outdoor antenna is necessary unless this unit is used in an area where signals are especially weak.

How to use the AM ferrite-bar antenna

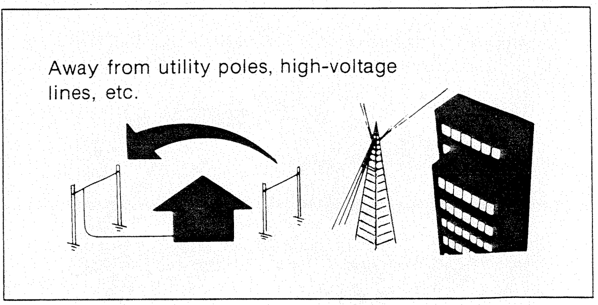
Pull the AM ferrite-bar antenna outward to the position where reception is best.


AM ferrite-bar antenna

To prevent noise:
Do not bring speaker connection wires or the power cord near this antenna.

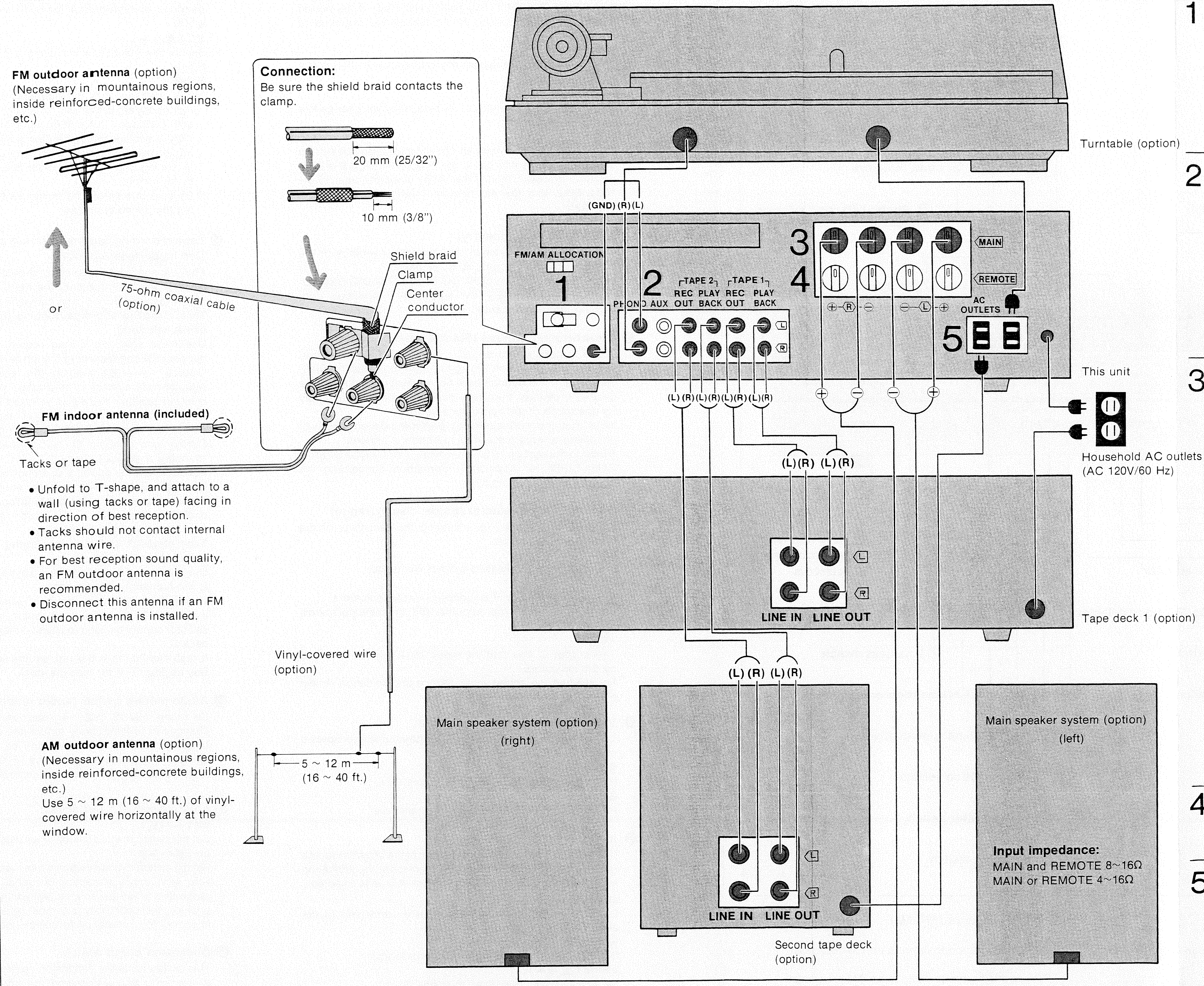
Connection of an outdoor antenna

If an outside AM antenna is installed (in mountainous regions or between reinforced-concrete buildings), install it in a location away from utility poles, high-voltage power lines, high buildings and busy roads.


Away from utility poles, high-voltage lines, etc.

Note:
An outdoor antenna should be installed by a competent technician only.

STEREO SYSTEM COMPONENTS AND THEIR CONNECTIONS


Turntable (option)
(GND) (R) (L)
FM/AM ALLOCATION
1
2
3
4
5
PHONO AUX
TAPE 2
TAPE 1
REC OUT
PLAY BACK
REC OUT
PLAY BACK
MAIN
REMOTE
⊕ R ⊖
⊖ L ⊕
AC OUTLETS
L
R
This unit
(L) (R) (L) (R) (L) (R) (L) (R)
Household AC outlets
(AC 120V/60 Hz)
(L) (R) (L) (R)
LINE IN LINE OUT
Tape deck 1 (option)
(L) (R) (L) (R)
LINE IN LINE OUT
Second tape deck
(option)
Main speaker system (option)
(right)
Main speaker system (option)
(left)
20 mm (25/32")
10 mm (3/8")
Shield braid
Clamp
Center conductor
75-ohm coaxial cable
(option)
or
Tacks or tape
Vinyl-covered wire
(option)
5 ~ 12 m
(16 ~ 40 ft.)

FM outdoor antenna (option)
(Necessary in mountainous regions, inside reinforced-concrete buildings, etc.)

Connection:
Be sure the shield braid contacts the clamp.

FM indoor antenna (included)

- Unfold to T-shape, and attach to a wall (using tacks or tape) facing in direction of best reception.
- Tacks should not contact internal antenna wire.
- For best reception sound quality, an FM outdoor antenna is recommended.
- Disconnect this antenna if an FM outdoor antenna is installed.

AM outdoor antenna (option)
(Necessary in mountainous regions, inside reinforced-concrete buildings, etc.)
Use 5 ~ 12 m (16 ~ 40 ft.) of vinyl-covered wire horizontally at the window.

Input impedance:
MAIN and REMOTE 8~16Ω
MAIN or REMOTE 4~16Ω

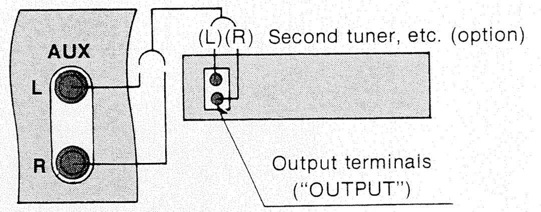
1 FM/AM allocation selector (FM-AM ALLOCATION):

The steps between broadcasting stations may differ in different localities.
This selector can be used to select either FM 0.2 MHz/AM 10kHz steps, or FM 0.05 MHz/AM 9kHz steps. Set to the appropriate position for your locality.

Note: The power of this unit must be turned off before this selector is set.

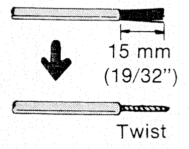
2 "AUX" terminals:

8-track stereo tape deck (playback only) or second tuner.

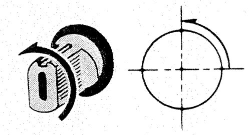

AUX
L
R
(L) (R) Second tuner, etc. (option)
Output terminals
("OUTPUT")

3 Connection of speaker wires:

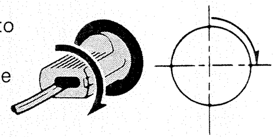
① Strip off the outer covering, and twist the center conductor.


15 mm
(19/32")
Twist

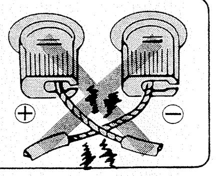
② Turn completely to the left.



③ Insert wire and turn completely to the right.
Pull wire to be sure it won't come out.



Note:
To prevent damage to circuitry, never short-circuit plus (+) and minus (−) speaker terminals.



4 "REMOTE" terminals:

Connection to second pair of speakers.

5 "SWITCHED" outlet:

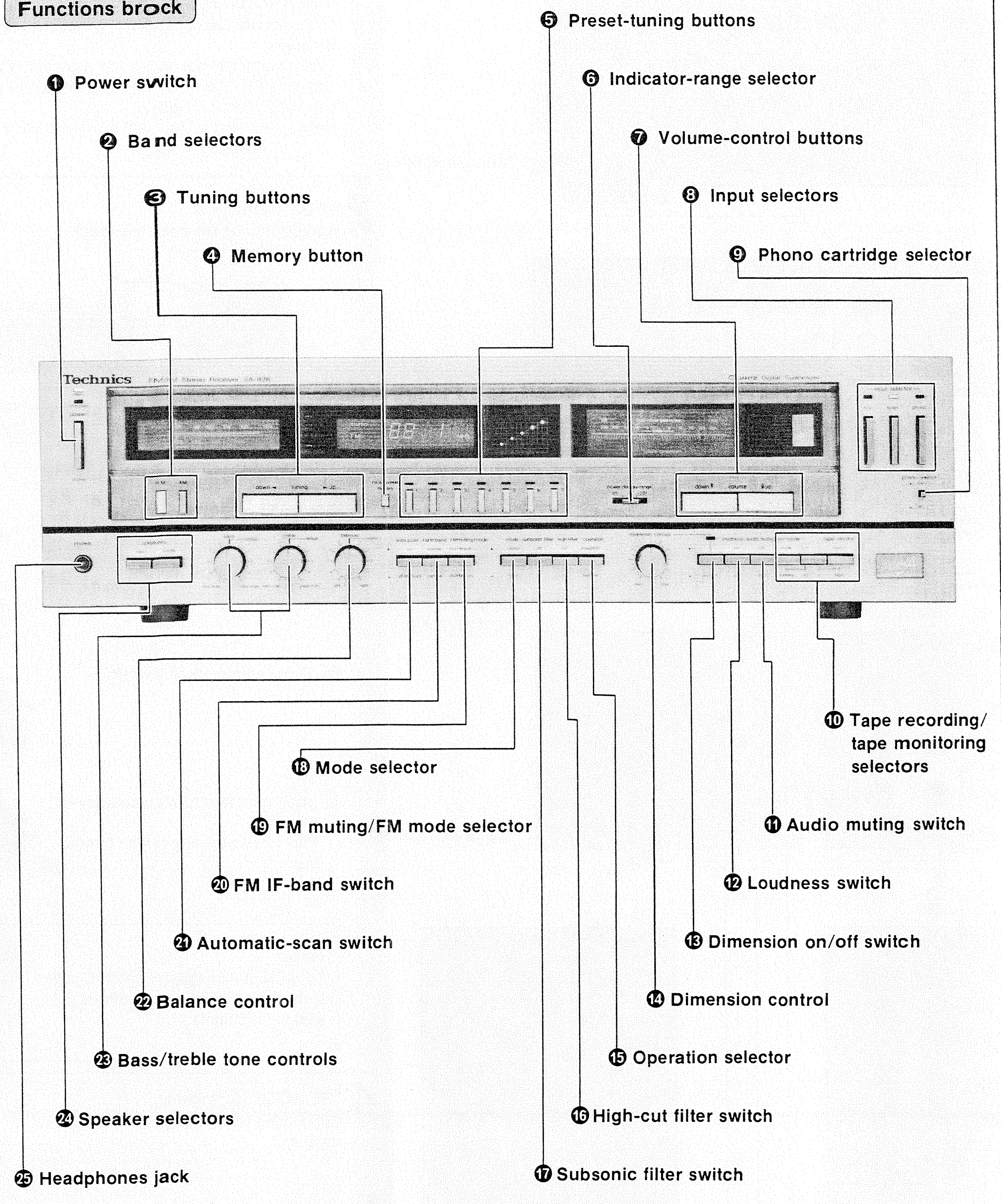
Power is controlled by power switch of this unit. Equipment rated up to 150 W can be connected.

"UNSWITCHED" outlet:
Power is always available, regardless of power switch setting. Equipment rated up to 150 W can be connected.

FRONT PANEL CONTROLS AND THEIR FUNCTIONS

Note:
A delay of several seconds from the time the power is turned on to the time sound will be heard is normal and is part of the design of this unit.

Functions brock



❶ Power switch (power)

Note:
Be sure to turn the volume control ⑦ to the minimum ("0") position before turning on the power.

❷ Band selectors (FM/AM)

FM:
Press this button to listen to an FM broadcast.
AM:
Press this button to listen to an AM broadcast.

❸ Tuning buttons (tuning)

These buttons are used for tuning to the desired broadcast station. The frequency range of this unit is from 87.9 to 107.9 MHz (FM), and from 530 to 1620 kHz (AM). When either of these buttons is pressed once, the frequency is changed by 0.2 MHz (200 kHz) (FM) and 10 kHz (AM). If the button is pressed continuously, the frequency will continue to change.

◀ down:
When this button is pressed, the frequency will change to a lower frequency.

▶ up:
When this button is pressed, the frequency will change to a higher frequency.

Note:
This unit is equipped with an FM/AM allocation selector on the rear panel. If it is set to the "FM 0.05 MHz/AM 9 kHz" position, however, the FM frequency range becomes 87.5~108.0 MHz, and the AM frequency range becomes 522~1611 kHz.

❹ Memory button (memory)

This button is used when preset memory settings of the seven preset-tuning buttons ⑤ are made.
(Refer to the section "HOW TO PRESET RADIO BROADCAST FREQUENCIES" for additional information concerning the preset memory system.)

❺ Preset-tuning buttons (FM/AM preset)

These buttons are to be used when presetting broadcast frequencies, and when tuning to preset broadcast frequencies. After these buttons have been preset once, tuning to a desired broadcast frequency can be accomplished simply by one touch of the appropriate button.
Note that the corresponding preset-indication LED will illuminate when a preset-tuning button is pressed.
(Refer to the section "HOW TO PRESET BROADCAST FREQUENCIES" for additional information concerning the preset memory system.)

❻ Indicator-range selector (power display/range)

This selector is used for changing the sensitivity of the peak-power indicators.

off:
The peak-power indicators will not illuminate.

×1:
The output of this unit is indicated by the indicators.
For example, when the output is 10W, the indicators show 10W.

×0.01:
The output of this unit increased by 100 times is shown by the indicators.
For reading the actual value, reduce the indication shown by the indicators to 1/100.

❼ Volume-control buttons (volume)

These buttons can be used to adjust the volume level upward or downward.

▼ down:
Press this button to reduce the volume level.

▲ up:
Press this button to increase the volume level.

❽ Input selectors (input selector)

These selectors are used for selection of the program source (disc, radio broadcast, etc.). The corresponding indication lamp will illuminate when that program source is selected.

aux (■→▬):
Set to this position to use equipment connected to the auxiliary input terminals ("AUX").

tuner (■→▬):
Set to this position to listen to radio broadcasts.

phono (■→▬):
Set to this position to listen to phono discs.

❾ Phono cartridge selector (phono selector)

This selector should be set to the position which corresponds to the type of cartridge used on the turntable.

MM (▬→■):
Set to this position when using a moving-magnet type cartridge or high-output moving-coil cartridge (1 mV or more).

MC (■→▬):
Set to this position when using a moving-coil type cartridge.

Notes:
1) The speakers may be damaged if (with this selector incorrectly set to the "MM" position for use with a moving-coil cartridge) the setting is changed to the correct ("MC") position while the disc is playing. Before changing the setting, be sure to first reduce the volume control ⑦ setting to minimum in order to avoid speaker damage by high input.
2) Be sure to turn off the power switch ① before changing the phono cartridge.

❿ Tape recording/tape monitoring selectors (rec mode/tape monitor)

The left and center selectors should be used during recording and tape dubbing; the right and center selectors should be used during tape playback and tape monitoring.

Tape recording and tape dubbing (by using the left and center selectors)
Use these selectors during recording and during tape dubbing. During recording the left selector should be in the "source" (▬→■) position (the position of the center selector has no effect on recording). When the left selector is in this position, the signal selected by the input selector will be emitted from the "REC OUT" tape terminals (located on the rear of the unit) at a constant preset level.
During tape dubbing the left selector should be in the "dubbing" (■→▬) position.
In addition, if the dubbing operation is from tape deck 1 to tape deck 2, the center selector should be in the "1▶2" (■→▬) position; if the dubbing operation is from tape deck 2 to tape deck 1, the center selector should be in the "2▶1" (▬→■) position.

Tape playback and tape monitoring (by using the right and center selectors)
Use these selectors during tape playback, and if monitoring is desired, during recording.
During tape playback, the right selector should first be set to the "tape" (■→▬) position, and then the center selector should be used to select either tape deck 1 or tape deck 2.
If tape monitoring is desired, set the selectors in the same way as described for tape playback.

⓫ Audio muting switch (audio muting)

Set to the "−20 dB" (■→▬) position when a disc is being changed or to temporarily reduce the volume level.
In addition, the volume level can be adjusted more precisely if this switch is set to the "−20 dB" (■→▬) position for listening at a low volume level.

⓬ Loudness switch (loudness)

off (▬→■):
Set the switch to this position when listening at high volume.

on (■→▬):
Set the switch to this position when listening to music at low volume. Auditory perception of sound in the low frequency range falls off at low volume, but when the switch is in this position, this deficiency is compensated for, so that the full impact of the musical performance can be enjoyed.

⓭ Dimension on/off switch

This switch turns the dimension controls on or off.
At the "on" (■→▬) position, the indicator will illuminate.

off (▬→█):
Sound by-passes the dimension controls unchanged.
on (█→▬):
Makes it possible to adjust the "presence" of sound. (dimensional)

⑭ Dimension control (dimension control)

This control is used to adjust the sound's feeling of "presence".
This control is used to adjust the reproduced sound's feeling of spaciousness to the left and right; the further it is turned to the right, the more this expansiveness is enhanced.
In conventional stereo reproduction, the sound image is localized between the left and right speaker systems. By operating this control, however, the range of sound image localization can be extended beyond the left and right speaker systems.
Furthermore, if this control is set to the "min" position, the sound reproduction becomes the same as that of conventional stereo.

⑮ Operation selector (operation)

This selector is used in order to obtain the maximum performance capability of the DC main amplifier section of this unit, driving the speaker systems with the best frequency response of high-level input signals.
straight DC (▬→█):
When the selector is set to this position, the high-level input signals received at the "TUNER" and "AUX" terminals are directly amplified at the main amplifier section, without passing through the tone-control circuitry, and the unit operates as a complete direct-coupled amplifier to drive the speaker system.
Note that the high-cut filter switch ⑯, subsonic filter switch ⑰ and the tone controls ㉓ have no effect when the selector is set to this position.
via tone (█→▬):
When the selector is set to this position, input signals pass through the tone-control circuitry on their way to the main amplifier section.
Set the selector to this position to use the high-cut filter switch ⑯, subsonic filter switch ⑰ and the tone controls ㉓.

⑯ High-cut filter switch (high filter)

off (▬→█):
Set to this position for ordinary use.
on (█→▬):
Set to this position to eliminate high-frequency noise such as tape "hiss" noise, a scratched disc, etc.

⑰ Subsonic filter switch (subsonic filter)

off (▬→█):
Set to this position for ordinary use.
on (█→▬):
Set to this position to eliminate ultra-low-frequency noise such as motor "rumble" and unusual vibration of the woofer cone caused by a warped disc, etc.

⑱ Mode selector (mode)

stereo (▬→█):
Set to this position to listen in stereo.
mono (█→▬):
Set to this position to listen monaurally. The left and right sounds will be mixed, and the same sounds will be heard from both speakers.

⑲ FM muting/FM mode selector (FM muting/mode)

This selector can be used during tuning to eliminate the annoying noise between FM broadcast stations, and to select either stereo or monaural reception of FM broadcasts. There is no effect upon AM broadcasts.
on/FM auto (▬→█):
Set to this position for ordinary use. FM stereo and monaural broadcasts can be received, and between-station noise is eliminated.
off/FM mono (█→▬):
All broadcasts will be received monaurally.
Use at this position if there is excessive noise in stereo broadcasts or if signals are weak because of reception far from the broadcasting station or in a mountainous region, when the broadcast cannot be heard at the "on/FM auto" position.
To avoid between-station noise, reduce the setting of the volume control before tuning.

⑳ FM IF-band switch (FM IF band)

This switch can be used to prevent interference from nearby broadcast stations.
normal (▬→█):
The unit should under normal circumstances be used with the button in this position (released outward).
narrow (█→▬):
Broadcasts might be affected by interference if there are many broadcast stations or if there is a station nearby the station being received.
If so, press this switch in. At this position, distortion may increase slightly, but interference from nearby stations can be prevented.

㉑ Automatic-scan switch (auto scan)

This switch can be used to select either automatic tuning or manual tuning when used in conjunction with the tuning button ③.
on (▬→█):
When one of the tuning buttons is pushed once the next strong station will automatically be tuned in.
off (manual) (█→▬):
The frequency will change by one "step" when one of the tuning buttons is pressed once, or will change continuously while a tuning button is pressed continuously.

㉒ Balance control (balance)

To balance the left and right volume levels, set the mode selector ⑱ to the "mono" position, and use this control to balance the sound so that it seems to be heard from the position half-way between the speakers.

㉓ Bass/treble tone controls (bass/treble)

The bass control is for the low-frequency sound range, and the treble control is for the high-frequency sound range.
Note that when these controls are set to the "defeat" position, they no longer function as tone controls, and the frequency response becomes flat.

㉔ Speaker selectors (speakers)

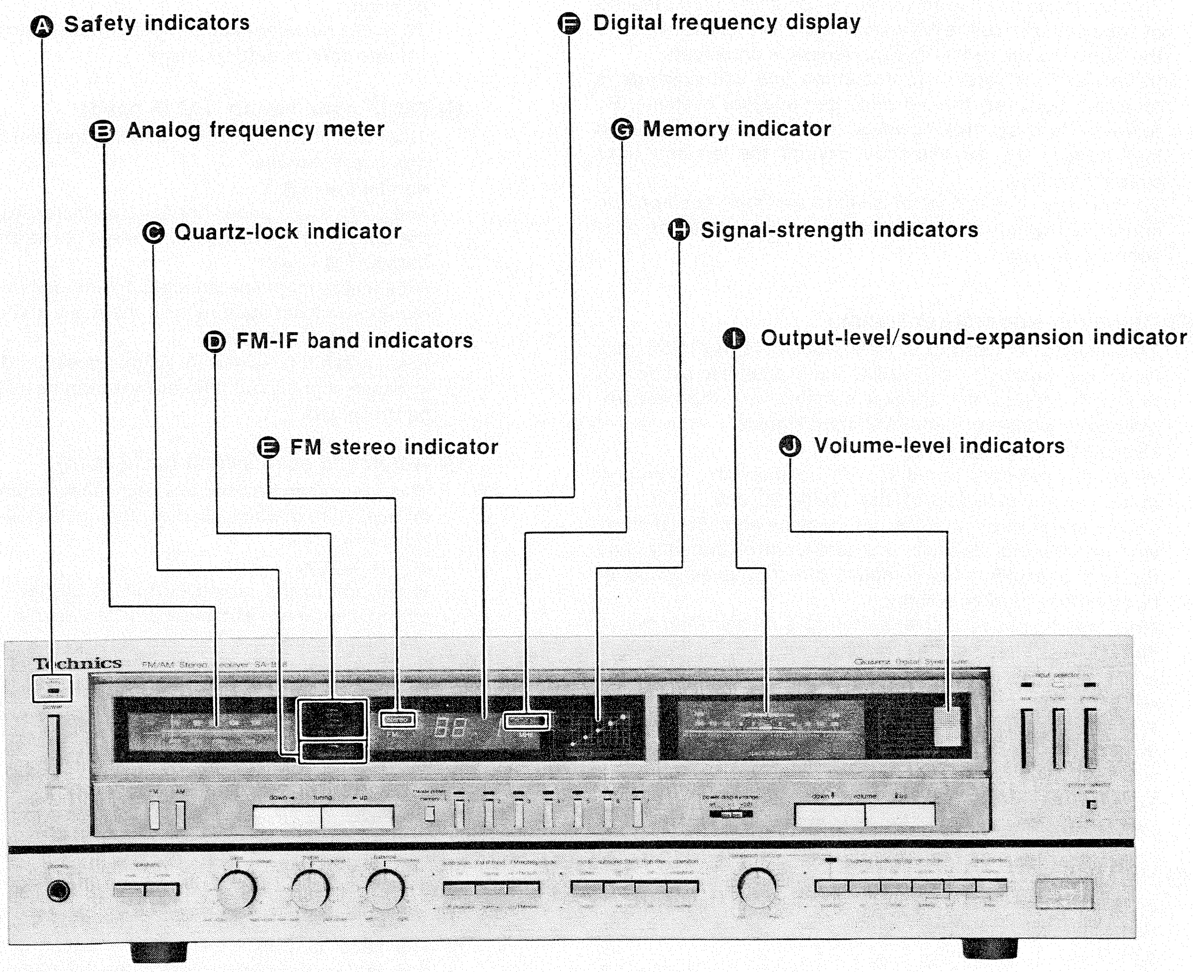
These selectors are used to turn the speaker systems on and off. When they are pressed (█→▬), the speaker systems can be heard.
main:
Sound can be heard from the speaker systems connected to the "MAIN" terminals.
remote:
Sound can be heard from the speaker systems connected to the "REMOTE" terminals.
Note:
When these selectors are operated, the safety indicators Ⓐ will first turn red and then return to green.

㉕ Headphones jack (phones)

Note:
Be sure to set the volume level to the minimum ("0") before connecting the headphones.

FRONT PANEL CONTROLS AND THEIR FUNCTIONS (continued)

Indicators brock


Ⓐ Safety indicators
Ⓑ Analog frequency meter
Ⓒ Quartz-lock indicator
Ⓓ FM-IF band indicators
Ⓔ FM stereo indicator
Ⓕ Digital frequency display
Ⓖ Memory indicator
Ⓗ Signal-strength indicators
Ⓘ Output-level/sound-expansion indicator
Ⓙ Volume-level indicators
Technics

Ⓐ Safety indicators (protection/safety)

These indicators indicate whether this unit is functioning normally or not.
When the power is turned on, the red indicator will illuminate first. It will extinguish after about 4 seconds, and the green indicator will then illuminate.
The green illumination indicates that the unit is is functioning normally, and operation can then be started.
If there is an abnormal condition during use, the red indicator will illuminate, request assistance from your dealer.

Note:
When the speaker selectors ㉔ are operated, the indicators will first turn red and then return to green.

Ⓑ Analog frequency meter

The reception frequency of the FM or AM broadcast selected by using the tuning buttons or the pre-set tuning buttons is indicated by a needle-type display.

Note:
As there may be a slight deviation in the reception frequency indicated by the pointer of the analog frequency meter, tuning to a radio station should be done while watching the digital indicator.

Ⓒ Quartz-lock indicator (quartz lock)

This indicator illuminates when a broadcast is received. It will not illuminate if the signal from the broadcast station is weak.

Ⓓ FM-IF band indicators (FM IF band)

These indicators illuminate to indicate the operation condition of the FM-IF band selector ⑳.

Ⓔ FM stereo indicator (stereo)

This indicator automatically illuminates when an FM stereo broadcast is being received.

Note:
It will, however, not illuminate if the FM muting/FM mode selector ⑲ is set to the "off/FM mono" position.

Ⓕ Digital frequency display

The reception frequency of the FM or AM broadcast selected by using the tuning buttons or the pre-set tuning buttons is indicated by a digital-type display.

Ⓖ Memory indicator (memory)

This indicator illuminates when the memory button ④ is pressed.
When presetting the frequency of an FM or AM broadcast station, press one of the preset-tuning buttons ⑤ during the time (about 5 seconds) that this indicator is illuminated.

Note:
Refer to page 12 for information concerning preset tuning.

Ⓗ Signal-strength indicators (signal strength)

These indicators show the relative strength of broadcast signals being received by the antenna. The best condition for reception, for FM and AM, is when the indicators illuminate completely to the right.

Ⓘ Output-level/sound-expansion indicator

The output level is indicated by the single horizontal line, while the sound expansion is indicated by the flashing pattern.
The larger the output and the greater the expansion is the larger is the indication on the indicator. For a monaural signal the indication is small.
With the dimension on/off switch at "off" (▬→■) only the output level is indicated.

Ⓙ Volume-level indicators (volume range)

These indicators indicate the volume level selected by pressing the volume-control buttons ⑦.

DESCRIPTION OF THE AUTOMATIC SPEAKER-IMPEDANCE-COMPARATOR CIRCUITRY

1. This unit employs unique automatic speaker-impedance-comparator circuitry to deliver optimum amplifier power output at the following recommended speaker loads.

MAIN or REMOTE	4 ohms or greater
MAIN and REMOTE	8 ohms or greater

2. Only one set of speakers should be connected to each speaker terminal at one time, and external accessories such as a switching device, monitors, etc. should not be connected as this will defeat the function of the circuit, causing possible fire or electric shock due to excessive temperature.

3. During initial set-up or when changing speakers, be sure to set the speaker selectors ㉔ or power switch ① to the "off" position (▬→■) first and then make the necessary connections. Check for proper polarity and then set the speaker selectors ㉔ or power switch ① to the "on" position (■→▬). It is important that this sequence be observed for the proper operation of the automatic speaker-impedance-comparator circuitry.

HOW TO PRESET RADIO BROADCAST FREQUENCIES

(Be sure to follow these steps in the numbered order.)

This unit can be used to preset as many as 14 radio broadcast frequencies: 7 FM and 7 AM. After broadcast frequencies have been preset as described below, any desired station can be quickly and easily selected by simply touching one button.

❶ Power: "on" (■→▬)

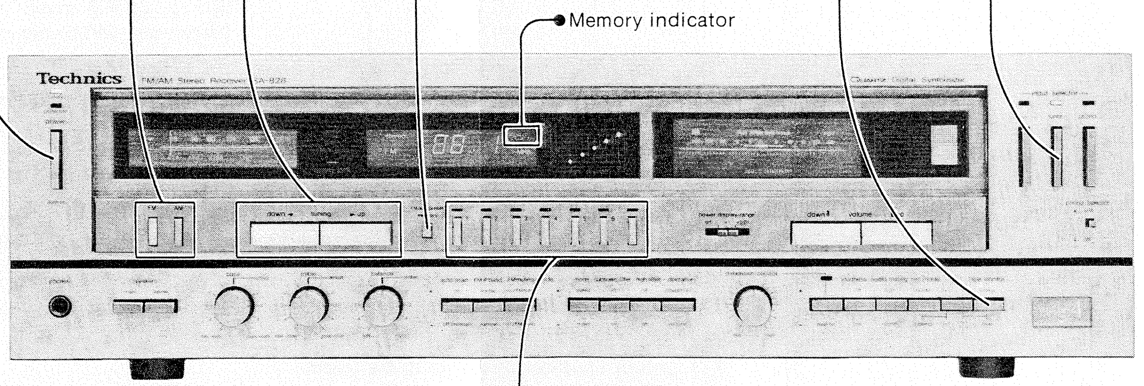
❷ "tuner" (■→▬)

❸ "source" (▬→■)

❹ To preset an FM station: press the "FM" button.
To preset an AM station: press the "AM" button.

❺ Press the appropriate tuning button to tune to the desired broadcast.
("up" for a higher frequency or "down" for a lower frequency)

❻ Press the memory button.
(The memory indicator will illuminate for about 5 seconds.)



❼ While the memory indicator is illuminated, press the preset-tuning button (1~7) which you want to use for that station.
When the button is pressed, the memory indicator illumination will stop, and the presetting is complete.
Note: If the memory indication illumination stops before you press the button, once again repeat step (6) and then step (7).

❽ It is suggested that you make a record, such as illustrated below, in order to keep a record of which station was preset for each button.
This completes the procedures for presetting radio broadcast frequencies. The other preset-tuning buttons can be preset in the same way by following steps (4) through (7).

Station \ Button	1ch.	2ch.	3ch.	4ch.	5ch.	6ch.	7ch.
FM	______ MHz	______ MHz	______ MHz	______ MHz	______ MHz	______ MHz	______ MHz
AM	______ kHz	______ kHz	______ kHz	______ kHz	______ kHz	______ kHz	______ kHz

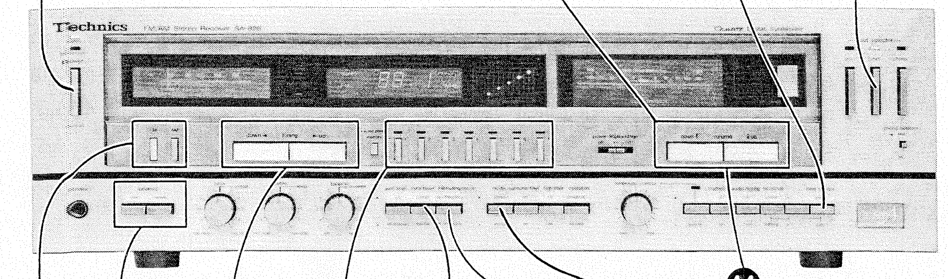
Note:
If a new frequency is preset for a button which had already been preset, the previous setting will be cancelled.

OPERATION

■ To listen to radio broadcasts

Notes:

1. Set to the "main" (▮→▬) position to use the speaker systems connected to the "MAIN" terminals.
2. Set to the "tape 1" (▬→▮) position to use the tape deck connected to the "TAPE 1" terminals.



① Power: "on" (▮→▬)

② Set volume control to low position for easier tuning.

③ "source" (▬→▮)

④ "tuner" (▮→▬)

⑤ **"FM"**: for FM broadcasts
"AM": for AM broadcasts

⑥ **Select speaker systems to be used.**
(Refer to note 1.)

7-1 Station selection:
If the station has not been preset: Tune to the desired station by pressing one of the tuning buttons.

7-2 Station selection:
If the station has been preset: Tune to the desired station by pressing the corresponding preset-tuning button.

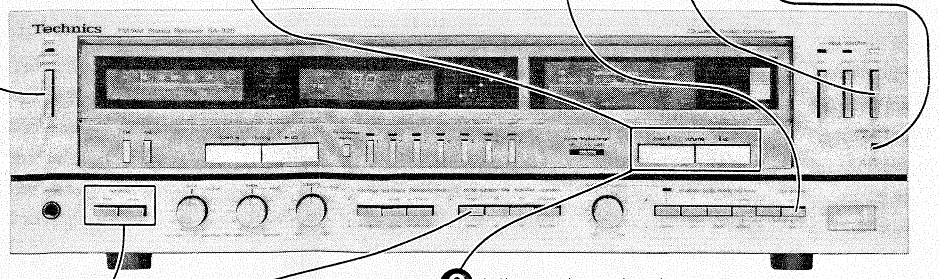
⑧ "normal" (▬→▮)
If interference from other stations prevents reception of the desired broadcasting station, set to the "narrow" position.

⑨ "on/FM auto" (▬→▮)
Set to "off/FM mono" position if noise is excessive. (Broadcast will be heard monaurally.)

⑩ "stereo" (▬→▮)

⑪ Adjust volume level.

■ To listen to phono discs



① Power: "on" (▮→▬)

② Press "down" button.

③ "source" (▬→▮)

④ "phono" (▮→▬)

⑤ "MM" (▬→▮):
for moving-magnet cartridge
"MC" (▮→▬):
for moving-coil cartridge

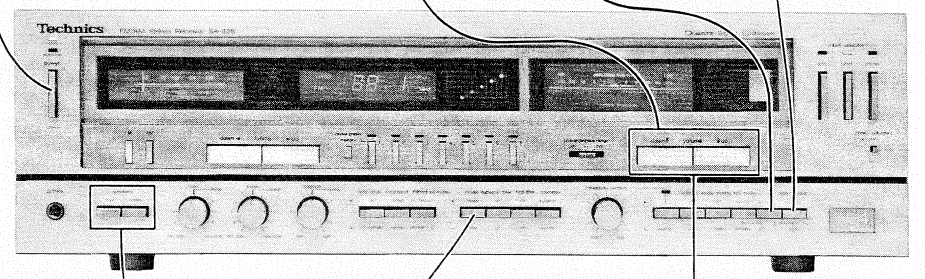
⑥ **Select speaker systems to be used.**
(Refer to note 1.)

⑦ "stereo" (▬→▮)

⑧ **Follow the instructions accompanying your turntable for set-up and operation.**

⑨ Adjust volume level.

■ To listen to tape



① Power: "on" (▮→▬)

② Press "down" button

③ **Select tape deck to be used.**
(Refer to note 2.)

④ "tape" (▮→▬)

⑤ **Select speaker systems to be used.**
(Refer to note 1.)

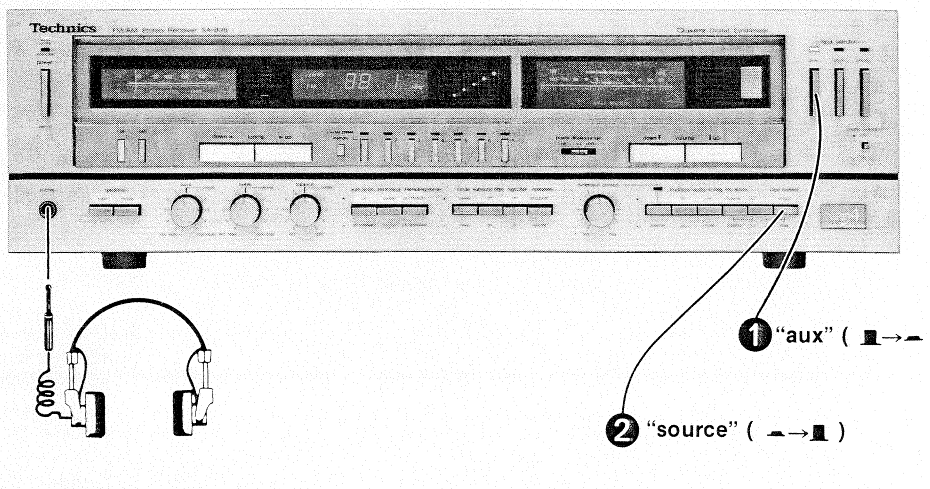
⑥ "stereo" (▬→▮)

⑦ **Follow your tape deck's operation instructions.**

⑧ Adjust volume level.

■ When listening through headphones

■ To listen to equipment connected to auxiliary ("AUX") input terminals



If sound from speakers is not wanted, set speaker selectors to off (▬→▮) position.
Note: Set volume control to minimum ("0") position before connecting headphones.

① "aux" (▮→▬)

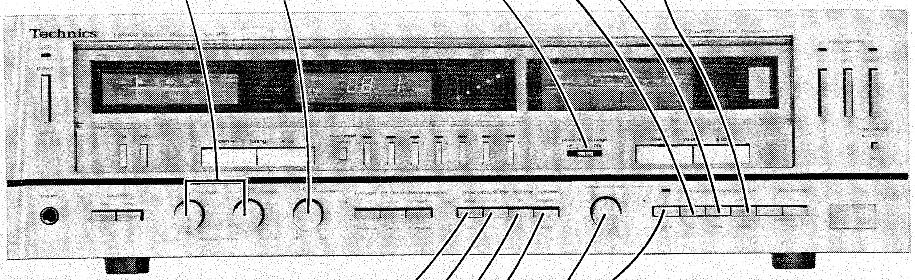
② "source" (▬→▮)

③ **Any equipment connected to the "AUX" terminals**
(Refer to the operating instructions for the optional equipment used.)

■ Steps required for all operations

(Follow these steps, as necessary, for all operations after adjustment of volume level.)

- Adjust to desired tone quality. If set to "defeat" position, tone controls have no effect, and frequency response becomes flat.
- Adjust left/right volume balance.
- When output level is low, set power display range selector to "0.01" for an output level indication 100 times higher by the power indicators.
- Press the switch to the "on" (■→▬) position when listening at a low volume level.
- Set to the "−20 dB" (■→▬) position to temporarily reduce the volume level.
- Select input signal for recording. (Refer to page 8.)



- Set to the "on" (■→▬) position to make it possible to adjust the "presence" of sound.
- Adjust the "presence" of sound as desired.
- Press inward to the "via tone" (■→▬) position before making adjustment of the tone quality (Refer to page 7 for additional detailed information.)
- Set to "on" (■→▬) position to eliminate noise in the high-frequency range (caused by FM broadcast, disc "scratch" or tape "hiss").
- Set to the "on" (■→▬) position to eliminate ultra-low-frequency noise (to eliminate turntable motor "rumble", etc.).
- Set to "mono" (■→▬) position to listen to sound monaurally (when adjusting left/right volume balance, etc.).

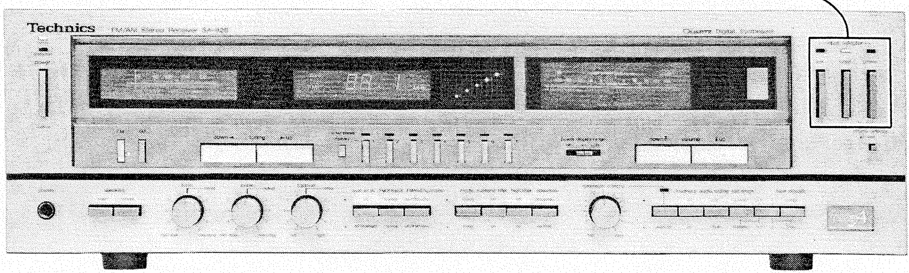
Note: After listening is finished, power switches of all equipment should be turned "off".

TAPE RECORDING AND TAPE-TO-TAPE RECORDING

Note:
Tape deck 1 is the tape deck connected to the "TAPE 1" terminals.

■ Tape recording

The level of the disc or radio broadcast signal emitted from the recording output terminals ("REC OUT") on the rear panel is always at a constant level, unaffected by the settings of other controls and switches.



❶ Select the sound source for recording

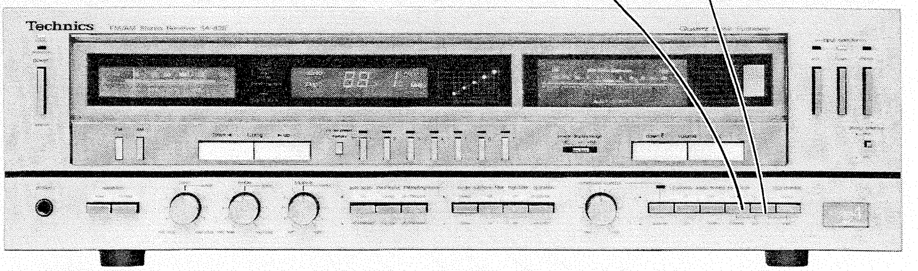
❷ Begin the disc play or tune to the radio broadcast.

❸ **Operation of tape deck**
By using the controls on the tape deck, make the adjustment of the recording level. Then begin recording.

■ Tape-to-tape recording

To record from tape deck 1 to 2 (or from 2 to 1)

If two tape decks are connected to this unit, recording can be made from one deck to the other.



❶ Rec mode selector "dubbing" (▮→▬)

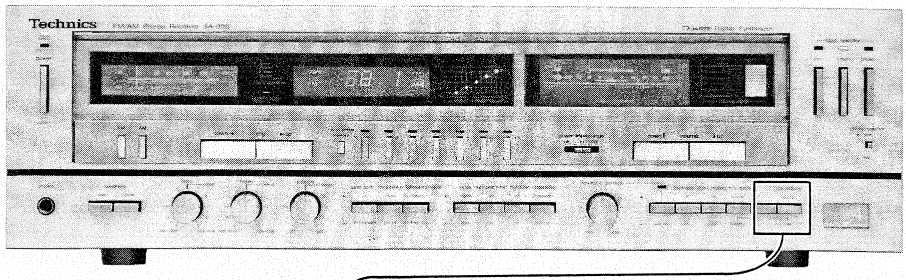
❷ Center selector "1▶2" (▮→▬) or "2▶1" (▬→▮)

❸ Tape deck 1 (or tape deck 2) ...... Begin playback

❹ Make the adjustment of the recording level by using the controls on tape deck 2 (or tape deck 1). Then begin the tape-to-tape recording.

❺ Tape deck 2 (or tape deck 1) .... Begin recording

■ Tape monitoring (three-head type tape deck only)



● To monitor the program which is being recorded, set the right selector to the "tape" position and center selector to the "1 or 2" position (refer to the tape deck's "front panel controls and their functions" for details of operation).

TECHNICAL SPECIFICATIONS

(IHF '78)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output 20 Hz~20 kHz both channels driven 0.005% total harmonic distortion	100W per channel (8 ohms)
1 kHz continuous power output both channels driven 0.001% total harmonic distortion	105W per channel (8 ohms) 110W per channel (4 ohms)
Dynamic headroom	1.3 dB (8 ohms)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.005% (8 ohms)
half power at 20 Hz~20 kHz	0.005% (8 ohms)
half power at 1 kHz	0.001% (8 ohms)
SMPTE intermodulation distortion	0.01% (8 ohms)
Frequency response	
PHONO	RIAA standard curve ±0.2 dB
AUX, TAPE	5 Hz~100 kHz, −3 dB 20 Hz~20 kHz, +0.2 dB, −0.2 dB
Input sensitivity	
PHONO MM	0.25 mV (2.5 mV, IHF '66)
MC	17 μV (170 μV, IHF '66)
AUX, TAPE	15 mV (150 mV, IHF '66)
S/N (IHF, A)	
PHONO MM	78 dB (87 dB, IHF '66)
MC	75 dB (70 dB, 250 μV input, IHF '66)
AUX, TAPE	80 dB (100 dB, IHF '66)
Maximum input voltage	
PHONO MM	145 mV (160 mV, 1 kHz)
MC	10 mV (11 mV, 1 kHz)
Input impedance	
PHONO MM	47 kilohms
MC	47 ohms
AUX, TAPE	22 kilohms
Tone controls	
BASS	50 Hz, +10 dB~ −10 dB
TREBLE	20 kHz, +10 dB~ −10 dB
Subsonic filter	30 Hz, −6 dB/oct.
High filter	7 kHz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Muting	−20 dB
Output voltage	
REC OUT	150 mV
Low frequency damping factor	40 (8 ohms) 20 (4 ohms)
Load impedance	
MAIN or REMOTE	4~16 ohms
MAIN and REMOTE	8~16 ohms

■ FM TUNER SECTION

Frequency range	87.9~107.9 MHz (0.2 MHz step) 87.50~108.00 MHz (0.05 MHz step)
Sensitivity	10.8 dBf (1.9 μV, IHF '58)
50 dB quieting sensitivity	
MONO	13.7 dBf (2.7 μV IHF '58)
STEREO	37.2 dBf (39.7 μV IHF '58)
Total harmonic distortion	
Wide 100 Hz	0.08% (MONO), 0.15% (STEREO)
1 kHz	0.08% (MONO), 0.1% (STEREO)
6 kHz	0.2% (MONO), 0.2% (STEREO)
S/N	
MONO	77 dB
STEREO	71 dB
Frequency response	20 Hz~15 kHz, +0.2 dB, −0.8 dB
Alternate channel selectivity	
wide ±400 kHz	75 dB
narrow ±300 kHz	80 dB
Capture ratio	1.2 dB
Image rejection at 98.1 MHz	80 dB
IF rejection at 98.1 MHz	90 dB
Spurious response rejection at 98.1 MHz	100 dB
AM suppression	60 dB
Stereo separation	
1 kHz	45 dB
10 kHz	40 dB
Carrier leak	
19 kHz	−65 dB
38 kHz	−70 dB
Antenna terminals	300 ohms (balanced) 75 ohms (unbalanced)

■ AM TUNER SECTION

Frequency range	530~1620 kHz (10 kHz step) 522~1611 kHz (9 kHz step)
Sensitivity	30 μV, 250 μV/m
Selectivity	55 dB
Image rejection at 1000 kHz	50 dB
IF rejection at 1000 kHz	40 dB

■ GENERAL

Power consumption	400W, 500 VA
Power supply	AC 120V, 60 Hz
Dimensions (W×H×D)	530 × 161 × 388 mm (20-7/8" × 6-11/32" × 15-9/32")
Weight	15 kg (33.1 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (HP. 3045 system).

TROUBLESHOOTING GUIDE

Before requesting service for this unit, check this table to determine if the problem can be solved as described below. If the problem still persists after making these checks, or if there are symptoms of malfunction not described in this table, it is recommended that you consult the store where this unit was purchased or your local Service Center (see list included) for further information and assistance.

	Problem	Probable cause(s)	Suggested remedy
During disc play	**A loud and unusual sound ("howling") is heard when the volume level is increased.**	The location of the turntable and speaker systems is unstable.	• Set the subsonic filter switch ⑰ to the "on" position (▮→▬). • If the equipment is unstable because it is located upon a soft surface, such as a carpet, place a solid material (such as concrete blocks, bricks, a hard board, etc.) beneath the speaker systems. • Close the cover of the turntable. • Try moving the turntable farther away from the speaker systems. • Try placing a cushioning material (such as felt or commercially available audio insulators) beneath the turntable.
	Unusual scratching noises are heard.	Disc is old or scratched.	• Turn the treble tone control ㉓ to reduce the treble sound.
		Dust in disc grooves.	• Use a disc cleaner to remove the dust from the disc grooves.
		Stylus needle is worn.	• If the noise is heard even when a new disc is played, probably the stylus is worn. Replace it with a new stylus.
		Dust is attached to stylus tip.	• Remove the dust by using a soft brush.
	The sound lacks clarity and volume.	The cartridge selector ⑨ is incorrectly set to the "MM" (▬→▮) position when a moving-coil type cartridge is being used.	• Set the cartridge selector ⑨ to the "MC" (▮→▬) position.
	The high-frequency range cannot be clearly heard.	The cartridge selector ⑨ is incorrectly set to the "MC" (▮→▬) position when a moving-magnet type cartridge is being used.	• Set the cartridge selector ⑨ to the "MM" (▬→▮) position.
While listening to FM broadcasts	**An unusual hissing noise is heard when listening to the broadcast in stereo, but not heard when listening monaurally.**	A slight noise may be heard because the method used for modulation of FM stereo broadcasts is different than that used for monaural broadcasts.	• Try reducing the treble sound by turning the treble control ㉓. • Set the FM muting/FM mode selector ⑲ to the "off/FM mono" (▮→▬) position. (Note that the broadcast will then be heard as monaural sound.)
	Noise is excessive in both stereo and monaural broadcasts.	Poor location and/or direction of the antenna. Transmitting station is too far away.	• Try changing the location, height and/or direction of the antenna. • If an interior antenna is being used, change to an exterior antenna. • Try using an antenna with more elements.
	The FM stereo indicator or quartz lock indicator flickers, without completely illuminating.	Poor location and/or direction of the antenna. Transmitting station is too far away.	• Try changing the location, height and/or direction of the antenna. • If an interior antenna is being used, change to an exterior antenna. • Try using an antenna with more elements. • Try setting the FM IF-band selector ⑳ to the "narrow" position.
	Sound is distorted and/or the volume level becomes low.	Broadcast signals are being disturbed. Nearby automobile traffic or airplanes.	
	Excessive noise in stereo broadcasts; sometimes no sound is emitted.	Poor location and/or direction of the antenna. Transmitting station is too far away.	
	Excessive distortion in the sound of stereo broadcasts.	Nearby building or mountain. [Multi-path distortion is being caused by the mutual interference of broadcast signals received directly from the transmitting station (direct waves) and signals being reflected from nearby buildings or mountains (reflected waves).]	
	An unusual "popping" noise is heard when automobiles pass.	Such noise is called ignition noise, and occurs while the automobile engine is running.	• Relocate the antenna and the connection wires leading to it to a place farther away from where automobiles pass.
	A strange hissing noise is produced continuously or intermittently.	Caused by the "discharge phenomenon" and the "oscillation phenomenon" of electric appliances (such as fluorescent lights, TV, small series-type motors, rectification equipment, etc.).	• Try placing this unit farther away from such equipment. • Install noise-prevention equipment on this unit or on the electric appliance.

MODEL SA-828

SUPPLEMENTARY OPERATING INSTRUCTIONS

The operating instructions enclosed with this unit differ in certain respects, as described below, with the operation of this unit. These supplementary operation instructions describe only those points where there is a difference. The operating instructions enclosed with this unit should, therefore, be used in conjunction with these supplementary instructions for correct operation of this unit.

㉔ Speaker selectors (speakers) [See page 9]

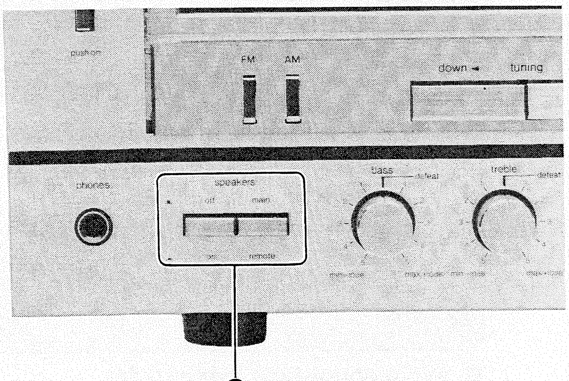
These selectors are to be used to select the speaker systems to be heard.
To hear the sound from speakers, the left selector should first be set to the "on" position, and then the right selector should be used to select either "main" or "remote".

VOLTAGE SELECTOR

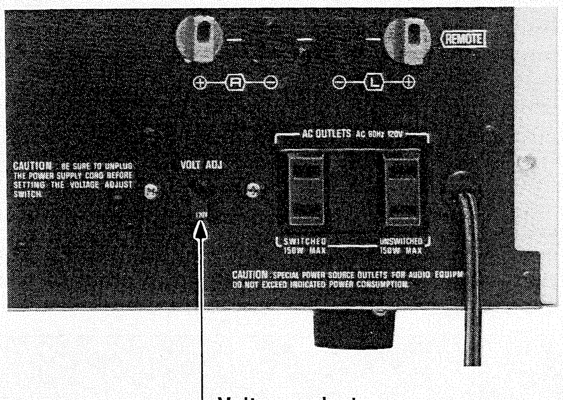
Use a flat-tip (−) screwdriver to set the voltage selector (on the rear of the unit) to the voltage setting for the area in which the set will be used: AC 50Hz/60Hz 110V/120V/220V/240V.

CAUTION

Be sure to disconnect the power supply cord before setting the voltage selector.


push on
FM
AM
down
tuning
phones
speakers
off
main
remote
bass
defeat
treble
defeat

㉔ **Speaker selectors**


REMOTE
R
L
CAUTION: BE SURE TO UNPLUG THE POWER SUPPLY CORD BEFORE SETTING THE VOLTAGE ADJUST SWITCH.
VOLT ADJ
AC OUTLETS AC 60Hz 120V
SWITCHED 150W MAX
UNSWITCHED 150W MAX
CAUTION: SPECIAL POWER SOURCE OUTLETS FOR AUDIO EQUIPM
DO NOT EXCEED INDICATED POWER CONSUMPTION.

Voltage selector

TECHNICAL SPECIFICATIONS

The following items are different from those shown in the operating instructions.

Rated minimum sine wave RMS power output
20 Hz~20 kHz both channels driven
0.005% total harmonic distortion
120W per channel (8 ohms)

1 kHz continuous power output
both channels driven
0.001% total harmonic distortion
125W per channel (8 ohms)

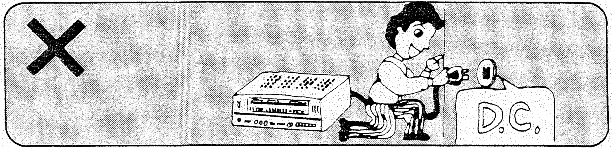
Dynamic headroom	1.6 dB (8 ohms)
Input sensitivity	
PHONO MM	0.25 mV (2.5 mV, IHF '66)
MC	17 μV (170 μV, IHF '66)
AUX, TAPE	15 mV (150 mV, IHF '66)
TAPE 1, 2	15 mV (150 mV, IHF '66)
Low frequency damping factor	40 (8 ohms)
Load impedance	
MAIN or REMOTE	8~16 ohms
Power consumption	630W
Power supply	AC 50 Hz/60 Hz 110V/120V/220V/240V
Dimensions (W×H×D)	530× 161× 388 mm (20-7/8"× 6-11/32"× 15-9/32")
Weight	16.4 kg (36.2 lb.)

Printed in Japan H0681H0 SQX51673

FOR SAFE USE OF THIS UNIT

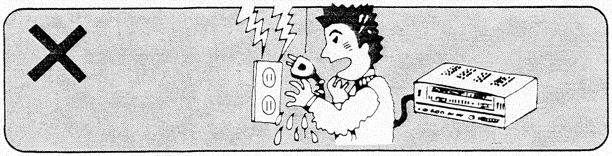
■ Use a standard electrical AC wall outlet

1. **Use from an AC power source of high voltage, such as for air conditioners, is very dangerous.**
   Be extremely careful not to make a connection to the electrical outlet for a large air conditioner or central-heating unit which uses high voltage, because there is the possibility of fire.
2. **A DC power source cannot be used.**
   Be sure to check the power source carefully, especially on a ship or other place where DC is used.



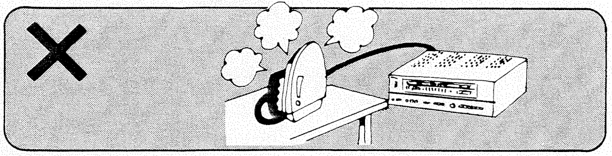
■ Connection and removal of the power cord plug

1. **Wet hands are dangerous.**
   A dangerous electric shock may result if the plug is touched by wet hands.
2. **Don't pull the power cord.**
   Always grasp the plug; never pull the cord itself.



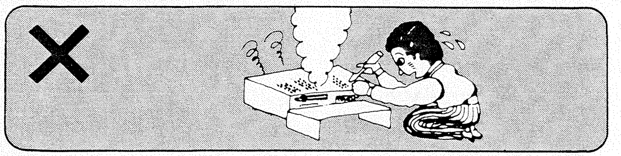
■ AC outlets on rear panel

1. **Any equipment connected here should have specified power consumption or less.**
   These outlets are exclusively for the connection of other audio equipment, such as a tape deck. Be sure the power consumption does not exceed the wattage specified near the AC outlets.
2. **Never connect other electrical appliances, such as an iron or toaster.**
   If appliances with a large power consumption are connected, an unexpected accident might occur as a result of overheating.



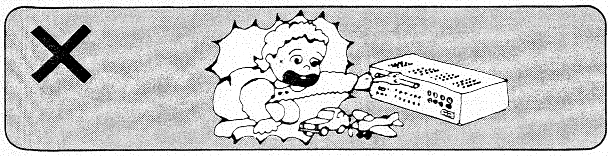
■ Never attempt to repair or reconstruct this unit

A serious electric shock might occur if this unit is repaired, disassembled or reconstructed by unauthorized persons, or if the internal parts are accidently touched.



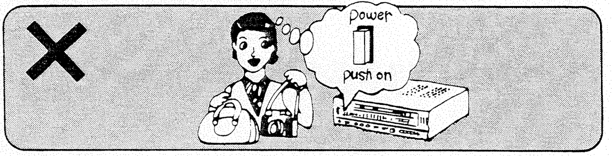
■ For families with children

Never permit children to put anything, especially metal, inside this unit. A serious electric shock or malfunction could occur if articles such as coins, needles, screwdrivers, etc. are inserted through the ventilation holes, etc. of this unit.



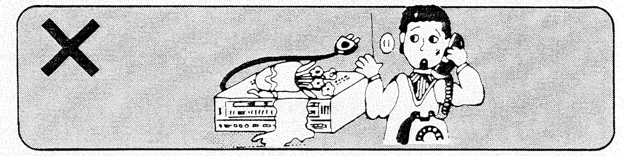
■ Turn off after use

If the unit is left for a long time with the power on, this will not only shorten its useful operation life, but may also cause other unexpected trouble.



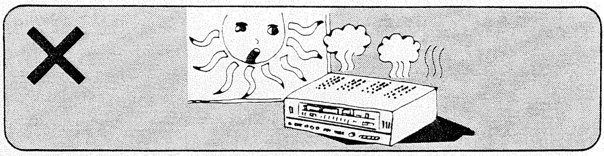
■ If water is spilled on the unit

Be extremely careful if water is spilled on the unit, because a fire or serious electric shock might occur. Immediately disconnect the power cord plug, and consult with your dealer.



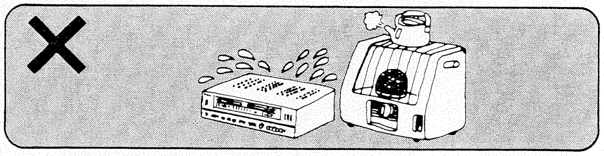
■ Place the unit where it will be well ventilated, and away from direct sunlight

Place this unit at least 10 cm (4") away from wall surfaces, etc., and away from direct sunlight. Be careful that curtains and similar materials do not obstruct the ventilation holes.



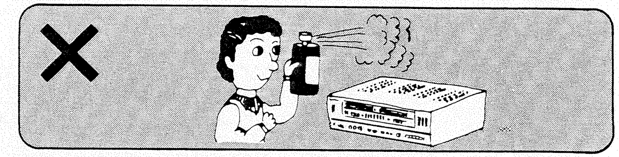
■ Keep the unit away from stoves, etc.

Heat can damage the external surfaces as well as internal circuits and components.



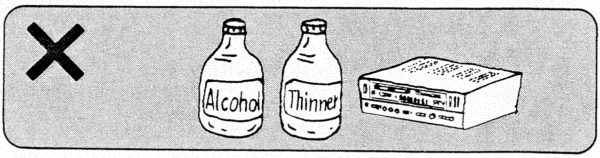
■ Avoid spray-type insecticides

Insecticides might cause cracks or "cloudiness" in the cabinet and plastic parts of this unit. The gas used in such sprays might, moreover, be ignited suddenly.



■ Never use alcohol or paint thinner

These and similar chemicals should never be used, because they may damage the finish.



■ If trouble occurs

If, during operation, the sound is interrupted or indicators no longer illuminate, or if abnormal odor or smoke is detected, immediately disconnect the power cord plug, and contact your dealer or an Authorized Service Center.

	Problem	Probable cause(s)	Suggested remedy
	Station selection cannot be made by using the preset-tuning buttons ⑤.	The preset-tuning buttons ⑤ have not been preset.	• Make the presettings.
		The batteries have become extremely weak, and the memory has been erased.	• Replace the batteries with new ones, and preset the frequencies once again.
While listening to AM broadcasts	**An unusual "beat" sound is heard.**	Unit is being used at the same time as the television set.	• Turn off the television set, or use this unit farther away from it.
		Interference from adjacent broadcast signal.	• By using the treble tone control ㉓, try reducing the treble sound.
	A low-pitched "hum" sound is heard when the broadcast is tuned.	The antenna connection wires are too close to the power cord.	• Place the antenna connection wires and the power cord farther apart.
		The power supply frequency from the power cord is modulated and heard from the speakers.	• Try reversing the connection of the power cord plug. • Install a special exterior antenna.
	A strange hissing noise is produced continuously or intermittently.	Caused by the "discharge phenomenon" and the "oscillation phenomenon" of electric appliances (such as fluorescent lights, TV, small series-type motors, rectification equipment, etc.).	• Try placing this unit farther away from such equipment. • Install noise-prevention equipment on this unit or on the electric appliance.
	Station selection cannot be made by using the preset-tuning buttons ⑤.	The preset-tuning buttons ⑤ have not been preset.	• Make the presettings.
		The batteries have become extremely weak, and the memory has been erased.	• Replace the batteries with new ones, and preset the frequencies once again.
Problems noted at all times	**No sound is heard when the power is turned on.**	The power cord plug is not completely inserted.	• Confirm that the power cord plug is connected completely.
		The power supply fuse has failed.	• Request the store where this unit was purchased, or a Service Center, to replace the fuse.
		Connections are incomplete or incorrect to the speaker systems, etc.	• Check to be sure that all connection wires are correctly connected.
		The setting of the input selectors ⑧ has not been completely or correctly made.	• Check to be sure that the selectors are set to the correct position.
		The right tape-monitor selector ⑩ is incorrectly set to the "tape" (■→▬) position.	• Except for tape playback, set the right tape-monitor selector to the "source" (▬→■) position.
		The speaker selectors ㉔ are incorrectly set to the "off" (▬→■) position.	• Set to the "on" (■→▬) position.
	When listening to stereo sound, the sound of the various musical instruments is not heard from its correct position.	The positive (+) and negative (−) connections of the speaker connection wires are reversed.	• Reconnect the speaker connection wires so that the positive and negative connections are correct.
	When listening to stereo sound, the left and right sounds are reversed.	The left and right connections of the speaker connection wires are reversed.	• Check the speaker connection wires and connect them correctly if necessary.
		The left and right connections of the connection wires connected to other equipment are reversed.	• Check the connection wires to other equipment and connect them correctly if necessary.
	A low-pitched noise ("hum" or "buzz") is heard.	The power cord or a fluorescent light, etc. is near the connection wires.	• Try separating this unit from the electric appliance as far as possible. • Reverse the connection of the power cord plug.
		The connection of the ground wire is incorrect or incomplete.	• Check to be sure that the grounding connection is correct. • If the unit is not grounded, try doing so.
	Sound is not heard from the speaker system on one side.	The speaker connection wires are disconnected.	• Check and correct the connections of the speaker connection wires.
		The balance control ㉒ is not set to the center position.	• Set the mark on the balance control to the center position.
	The volume level for a radio broadcast is different from that for disc play.	The strength of the broadcast signal is not the same as the output from the turntable.	• Adjust the volume level by using the volume control ⑦.
	Sound suddenly stops; protection-circuitry indicator illuminates.	A DC component is present at the input, causing the protection circuitry to function. Protection circuitry was activated by a short-circuit of the positive (+) and negative (−) speaker terminals or speaker connection wires.	• Check the connections to other equipment (especially the speaker connection terminals, etc.), and, if still no sound is heard, request service from the store where the unit was purchased or from your local Service Center.